



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,558	03/29/2004	Yoshio Ishii	04110/0201116-US0	4103
7278	7590	05/31/2007		
DARBY & DARBY P.C. P.O. BOX 770 Church Street Station New York, NY 10008-0770			EXAMINER POPOVIC, BOJAN	
			ART UNIT	PAPER NUMBER
			3709	
			MAIL DATE	DELIVERY MODE
			05/31/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/813,558

Applicant(s)

ISHII ET AL.

Examiner

Bojan Popovic

Art Unit

3709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/29/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 4/16/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Specification***

2. The abstract of the disclosure is objected to because it exceeds the length requirement set forth in MPEP § 608.01(b). Correction is required. See MPEP § 608.01(b).

### ***Claim Objections***

3. Claims 4 and 7 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only, and/or cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, claims 4 and 7 have not been further treated on the merits.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 2, 4, and 6-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "very small amount" in claim 2 is a relative term which renders the claim indefinite. The term "very small amount" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The specification offers no support as to the physical dimensions of the outer capillary tube or the flow rate through the tube.

Claim 6 is rejected under 35 U.S.C. 112, second paragraph as being dependent on rejected claim 2.

Claims 4 and 7 are rejected because claim 4 has an improper multiple dependent claim form, being dependent from both the rejected claim 2 and claim 3.

### ***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Sims et al. (U.S. Patent 6,248,157).

Regarding claim 1, Sims et al. disclose a vacuum control system for controlling the rotatory power of a DC brushless motor (132; Col 7 Lines 1-3), continuously controlling displacement of a vacuum pump (14; Col 4 Lines 32-40), and thus keeping

Art Unit: 3709

the degree of vacuum in a vacuum vessel constant (Col 2 Lines 51-63). The above described vacuum control system taught by Sims et al. operates by decompressing the inside of the vacuum vessel using an exhaust vacuum pump which operates with the DC brushless motor (Col 5 Lines 14-21), monitoring the inside pressure of a vacuum vessel using a pressure sensor (20; Col 5 Lines 32-36), and controlling the voltage applied to the DC brushless motor on the basis of an output signal resulting from measurement of the inside pressure of the vacuum vessel by the pressure sensor (16; Col 7 Lines 1-14).

Regarding claim 5, the Sims et al. reference teaches a vacuum degassing apparatus for removing dissolved gas from liquid isolated with a gas permeation diaphragm by reducing the inside pressure of a vacuum vessel including the gas permeation diaphragm with an exhaust vacuum pump (22 or 44, Col 3 Lines 60-68 and Col 5 Lines 26-32), the vacuum degassing apparatus employing the vacuum control system according to Claim 1.

Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Kozinski (U.S. Patent 6,289,924).

Regarding claim 3, Kozinski teaches a constant circulation resistance tube which is formed by coaxially inserting a resistance adjusting rod (128) into a hollow capillary (146 and 152) and which can control a flow rate of gas circulating between the inner circumference of the hollow capillary and the outer circumference of the resistance adjusting rod by adjusting a circulation resistance of the gas, wherein the circulation

Art Unit: 3709

resistance can be adjusted by varying an insertion length of the resistance adjusting rod inserted into the hollow capillary (Col 7 Lines 61-68 and Col 8 Lines 1-3).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sims et al. (U.S. Patent 6,248,157) in view of Tatsuji (Japanese Publication 08-024509) in further view of Kozinski (U.S. Patent 6,289,924).

Regarding claim 2, Sims et al. teach all of the limitations of claim 1 as described above. The Sims et al. reference; however, does not air introduction means of claim 2. Attention is now directed to the Tatsuji reference which discloses a deaeration device comprising a vacuum chamber (1), a vacuum pump (2) and an air introducing part (19). The air introduction system serves to introduce an amount of air into a vacuum exhaust path connecting the vacuum vessel to the exhaust vacuum pump. The reference also

shows an alternate location of the air introduction system (30). Although the Tatsuji reference teaches an introduction system, it does not meet the limitations as outlined in the specification of the present invention which requires the means for air introduction to be in the form of a constant circulation resistance tube. It should be noted that any structure capable of regulating air introduction in the Tatsuji system could be used in substitute of element 18, as long as the replacement does not change the scope of the invention. Examples include various solenoid controlled valves, capillary orifices and similar structures. Kozinski teaches a constant circulation resistance tube that regulates the circulation by adjusting the insertion length of the rod inserted into the hollow capillary. The structural details of the Kozinski invention are described in claim 3 rejection above. Therefore, replacing the air introduction mechanism taught by Tatsuji with the constant circulation resistance tube would not change the scope of the invention and it would be an obvious air introduction alternative to one of ordinary skill in the art.

At the time the invention was made, one of ordinary skill in the art would have been motivated to modify the vacuum control system taught by Sims et al. to include the air introduction means taught by Tatsuji that incorporates the constant circulation resistance tube of the Kozinski reference. Adding such air introduction means to the Sims et al. reference would be advantageous in that the system would not undergo damage in the case of solvent deaeration.

Regarding claim 6, the Sims et al. reference teaches a vacuum degassing apparatus for removing dissolved gas from liquid isolated with a gas permeation

Art Unit: 3709

diaphragm by reducing the inside pressure of a vacuum vessel including the gas permeation diaphragm with an exhaust vacuum pump (22 or 44, Col 3 Lines 60-68 and Col 5 Lines 26-32). The vacuum degassing apparatus of the Sims et al. reference; however, does not employ the vacuum control system according to Claim 2. Although the system contains all of the limitations taught by claim 1 of the present invention, the Sims et al. reference does not teach an air introduction system of claim 2.

Attention is now directed to the Tatsuji reference which discloses a deaeration device comprising a vacuum chamber (1), a vacuum pump (2) and an air introducing part (19). The air introduction system serves to introduce an amount of air into a vacuum exhaust path connecting the vacuum vessel to the exhaust vacuum pump. The reference also shows an alternate location of the air introduction system (30). Although the Tatsuji reference teaches an introduction system, it does not meet the limitations as outlined in the specification of the present invention which requires the means for air introduction to be in the form of a constant circulation resistance tube. It should be noted that any structure capable of regulating air introduction in the Tatsuji system could be used in substitute of element 18, as long as the replacement does not change the scope of the invention. Examples include various solenoid controlled valves, capillary orifices and similar structures. Kozinski teaches a constant circulation resistance tube that regulates the circulation by adjusting the insertion length of the rod inserted into the hollow capillary. The structural details of the Kozinski invention are described in claim 3 rejection above. Therefore, replacing the air introduction mechanism taught by Tatsuji with the constant circulation resistance tube would not change the scope of the



Art Unit: 3709

invention and it would be an obvious air introduction alternative to one of ordinary skill in the art.

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to modify the Sims et al. reference with the air introduction system taught by Tatsuji using the constant circulation resistance tube disclosed by Kozinski. The modification would not depart from the intended scope of the invention and it would improve the system performance in the case of deaeration of the solvent.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Barnitz et al (U.S. Patent 5,624,394) teach a vacuum system and a method of operating the vacuum system comprising a motor, pump and sensor/controller.

Gaudet et al. (U.S. Patent 6,461,113) teach an electronically controlled vacuum pump driven by a brushless DC motor.

Rousseau et al. (U.S. Patent 6,419,455) teach a system for maintaining constant pressure in a vacuum chamber and a vacuum pumping unit associated with the system.

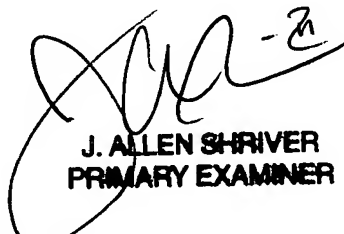
11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bojan Popovic whose telephone number is (571) 270-1889. The examiner can normally be reached on Mon-Fri, 8:00AM-5:00PM EST, Alternate Fridays.

Art Unit: 3709

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jackson can be reached on (571) 272-4697. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BP  
5/7/07



**J. ALLEN SHRIVER  
PRIMARY EXAMINER**